

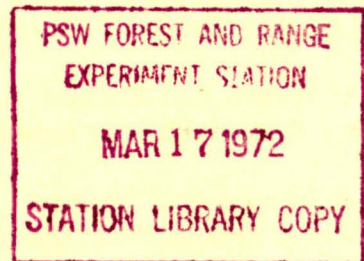
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REPORT ON

LAKE TAHOE REGION WASTEWATER COLLECTION, TREATMENT AND DISPOSAL

Prepared for
Tahoe Regional Planning Agency

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WASTEWATER COMMITTEE

William H. Anderman, Director
Environmental Health & Quality Control
El Dorado County Health Department

Lester Berkson, Attorney
Elk Point Sewer Improvement District No. 1, Tahoe-Douglas
Districts

Gene Clock, Division Director
Washoe County District Health Department

Harvey Collins, Associate Sanitary Engineer
State of California Department of Public Health

Glen Crawford, President
Tahoe Douglas General Improvement District

Russell L. Culp, General Manager
South Tahoe Public Utility District

David Dubois, Associate Engineer
Lahontan Regional Water Quality Control Board

Ernest Gregory, Chief
Nevada State Bureau of Environmental Health

M. D. Hansen, Civil Engineer
Tahoe Regional Planning Agency

Craig Johnson, Staff Engineer
Lahontan Regional Water Quality Control Board

William Layton, Manager
Tahoe City Public Utility District

Thomas E. Llewellyn, Manager
North Tahoe Public Utility District

John Marlar, Sanitary Engineer
Environmental Protection Agency

I. L. Miller, Manager
Round Hill General Improvement District

James Scribner, Sanitarian
Placer County Health Department

Harry Siebert, Civil Engineer
U. S. Forest Service Tahoe Basin Planning Team

Paul Ward, Assistant Chief, Bureau of Sanitary Engineering
State of California Department of Public Health

Wallace W. White, General Manager
Incline Village General Improvement District

James Williams, Public Health Engineer
Nevada State Bureau of Environmental Health

Jere Williams, County Engineer
Douglas County Sewer Improvement District No. 1

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LAKE TAHOE REGION WASTEWATER COLLECTION, TREATMENT AND DISPOSAL

HISTORY

Before the export of sewage began in 1968, there were nearly 950,000 pounds of nitrogen available annually to the waters of Lake Tahoe—more than twice the amount of nitrogen that would be available to the Lake under natural conditions. The Lake cannot assimilate this quantity of nitrogen; and even if it could, this volume would not remain the same, but would increase as the population increases. In recognition of the present and potential magnitude of nitrogen available from sewage, and in view of the fact that this is a controllable source of nitrogen, many governmental agencies have taken an affirmative position regarding the export of solid waste:

1. The Federal Water Pollution Control Administration's "Conference in the Matter of Pollution of the Interstate Waters of Lake Tahoe and its Tributaries" was held at Stateline, Nevada, in 1966, and one of the conclusions reached was that all sewage should be exported from the Lake Tahoe Basin.
2. In 1969, the California legislature added Section 13951 to the State Water Code. This section requires the export of sewage effluent from the Lake Tahoe Basin and prohibits the further maintenance or use of cesspools, septic tanks or other means of waste disposal in the Tahoe Basin after January 1, 1972. This legislation granted the Lahontan Regional Water Quality Control Board the authority to grant variances to areas where the Board finds that the continued operation of septic tanks or cesspools will not adversely affect the quality of the waters of Lake Tahoe, and that the sewerage of such areas would cause a damaging effect upon the environment.
3. The California Tahoe Regional Planning Agency adopted a similar regulation in 1969.
4. Nevada Governor Mike O'Callaghan issued an Executive Order on January 27, 1971, prohibiting the use of septic tanks in the Tahoe Basin after December 31, 1972.
5. Both the Nevada Tahoe Regional Planning Agency and its successor, the Tahoe Regional Planning Agency, specifically mentioned the export of sewage at an early date as a desirable goal.

In September of 1970, the TRPA formed the Wastewater Committee to compile information and make recommendations on the collection, treatment and disposal of sewage in the region.

Present Status of Sewage Export

In 1968, the South Tahoe Public Utility District put into operation an ultra-modern sewage treatment plant providing tertiary treatment, with the effluent being exported to the Indian Creek Reservoir in Apline County. Water from this reservoir is used for irrigation and recreation.

The North Tahoe Public Utility District and the Tahoe City Public Utility District constructed a jointly-financed sewage export line to the Cinder Cone disposal site and this site was put into operation in April of 1970. The Cinder Cone, located outside of the Lake Tahoe Basin, is considered only an interim method of sewage export and disposal; the two districts have joined with Alpine Springs County Water District, the Squaw Valley County Water District and the Truckee Sanitary District for the purpose of constructing a sewage line from Tahoe City to a point near Truckee, where a jointly-financed sewage treatment plant will be constructed. Several areas are now under consideration as potential disposal sites for the effluent from the proposed treatment plant. Before the project can get under construction there are a number of problems to be worked out, including the final disposal site, and the alignment of the export line along the Truckee River. If the problems are resolved soon, the system could be operational in 1975. Meanwhile, there is some consideration being given to bringing the North Shore and West Shore raw sewage to the South Tahoe Public Utility District's treatment plant for treatment and eventual export to the Indian Creek Reservoir.

The Washoe County Sewer Improvement District No. 1, serving the casino area at the north shore, contracts with the North Tahoe Public Utility District for sewage treatment and export.

The Incline Village General Improvement District began exporting sewage effluent over Spooner Summit to the Carson River in 1970 and has under construction a \$1.5 million expansion to its secondary treatment plant.

The Douglas County Sewer Improvement District No. 1 and the Round Hill General Improvement District constructed a jointly-financed treatment plant and began exporting sewage effluent over Dagget Pass into the Carson Valley in 1969. This effluent is used for irrigation purposes. The Douglas County Sewer Improvement District is in the process of acquiring the Round Hill General Improvement District's rights in the joint sewage treatment plant. When those rights are acquired, the Round Hill District will contract with the Douglas County District for sewage treatment and export.

The Elk Point Sewer Improvement District has formed a sewage assessment district and has contracted with the Douglas County Sewer Improvement District No. 1 for sewage treatment and export. These facilities to serve the Elk Point District should be completed and operational this year.

Kingsbury General Improvement District No. 2 has been absorbed by Kingsbury General Improvement District No. 1, and this district and the Tahoe Douglas General Improvement District have options with the South Tahoe Public Utility District for sewage treatment and export. These options expire on August 1, 1971. Engineering and assessment district procedures are in process and the Kingsbury and Tahoe-Douglas sewage should be exported by the end of 1972.

There are four relatively small areas on the north shore that are contiguous to the Lake and to the Incline Village General Improvement District, but are not in, or contracting with, any district for sewage treatment and export. Nevada Assembly Bill Number 264 which was adopted during the 1971 Legislative session, will allow these four areas to annex to the Incline Village General Improvement District and allow the district to assess annexation charges, subject to review by the State Public Service Commission. The inability of the District to assess annexation charges in the past has been a deterrent to District annexation. A fifth area, the Crystal Bay Subdivision, which is west of the Incline Village General Improvement District and east of the California state line, is unsewered and not in any sewer district at this time. There are also no definite arrangements for the sewerage of this area.

One area in California that is as yet unsewered and without a definite sewerage plan is the State-owned Vikingsholm in the Emerald Bay State Park. Either the South Tahoe Public Utility District or the Tahoe City Public Utility District could provide service, but no progress can be made to sewer this area until the California Department of Parks and Recreation makes a commitment as to which district they will choose.

On December 10, 1970, the Lahontan Regional Water Quality Control Board granted variances from Section 13951 of the Porter-Cologne Act and exempted from the sewage export mandate the following areas:

Echo Lake
Angora Lake
Lily Lake
Fish Hatchery Tract
Fallen Leaf Lake Tract - Lots 1, 19-23, 33,
35, 62 and 63

The Board requires that these areas meet the following restrictions:

- a. Seasonal occupancy be normally limited to the summer months.
- b. Toilet wastes be exported from the Lake Tahoe Basin or incinerated.
- c. Solid wastes be exported from the Lake Tahoe Basin.
- d. No automatic washing machines, dishwashers, or garbage disposals be used.
- e. Only natural soaps or phosphate-free cleaning agents to be used.
- f. Food wastes be exported from the Lake Tahoe Basin or incinerated.
- g. Wash waters be discharged to leaching areas located a minimum of 100 feet from any surface water, with a soil mantle adequate for percolation.

The following areas were considered for variances, but were found not to meet the requirements:

Kings View Subdivision
Glen Alpine
Emerald Bay
Echo Summit
Echo Road and Echo Chalet
East and South shore areas of Fallen Leaf Lake

The Kings View Subdivision is a subdivision of 50 lots, of a minimum 10 acres each, north of Kings Beach. There are no buildings on any of these lots.

In the Emerald Bay area, there are 26 homes on land leased from the U. S. Forest Service north of the Vikingsholm. The Eagle Falls picnic area and the Bayview guard station and campground,

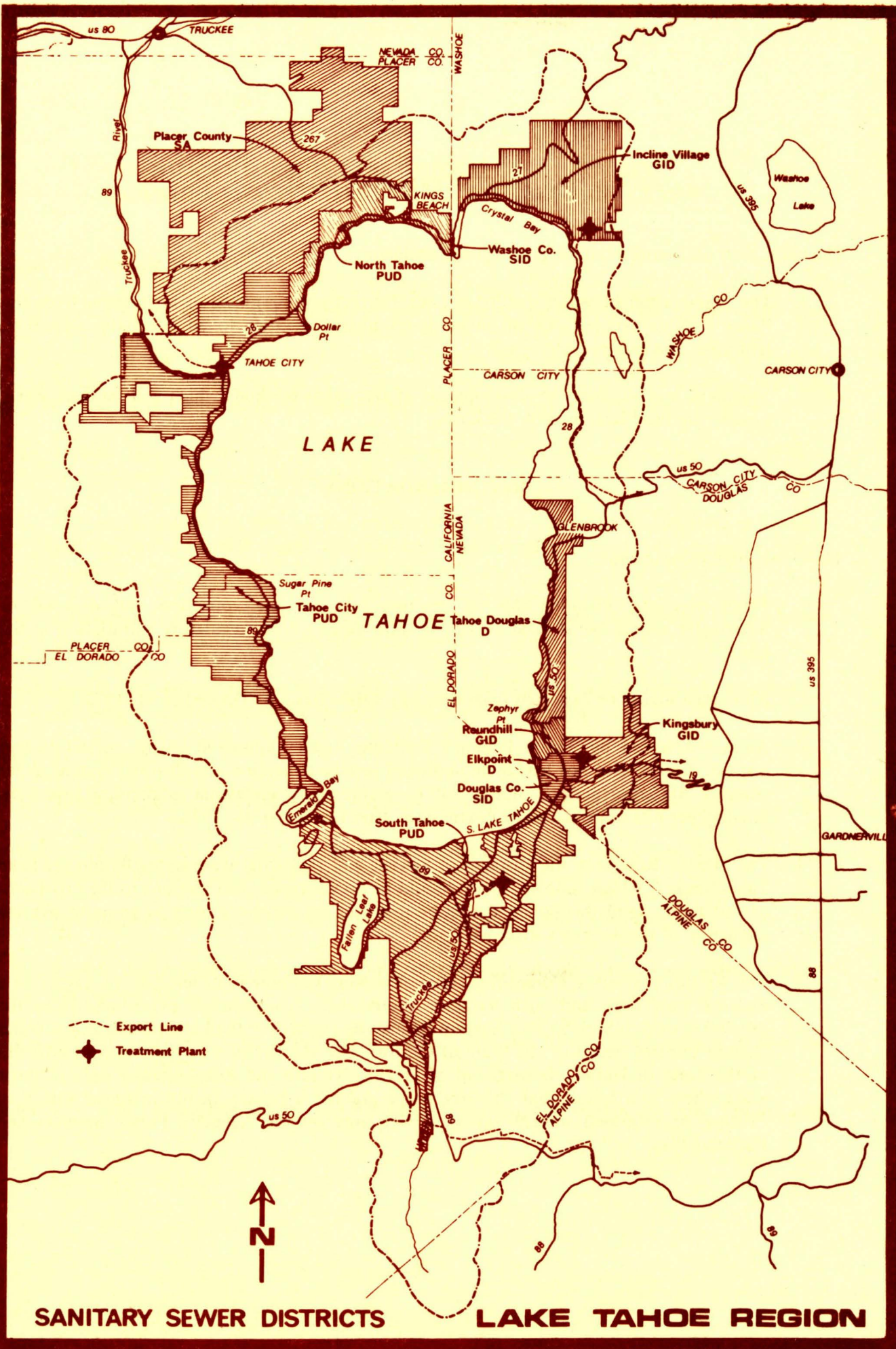
operated by the U. S. Forest Service, will store sewage in holding tanks and export periodically. The Bayview resort area is on U. S. Forest Service leased land and must comply with the sewage export to meet the lease conditions.

The Echo Summit and Echo Road areas on National Forest land will use holding tanks or export to the American River Basin. The Echo Chalet on Lower Echo Lake National Forest land will pump sewage out of the Basin.

The sewage export program is proceeding extremely well and only a miniscule portion of the Basin's population will be without sewage export service by the end of the current year.

The relative success of the sewage export program is due primarily to the efforts of the local districts and the financial participation by the Environmental Protection Agency. The Environmental Protection Agency, formerly the Federal Water Quality Administration, has provided the following grants to assist in the collection, treatment and export of sewage from the Tahoe Basin:

1. A Research and Development grant to the South Tahoe Public Utility District in the amount of \$1,022,000.
2. Construction grants to the South Tahoe Public Utility District totaling \$1,077,000.
3. Three construction grants to the North Tahoe Public Utility District totaling \$580,000.
4. Construction grants to the Tahoe City Public Utility District totaling \$591,720.
5. A construction grant in the amount of \$1,410,000 to the Round Hill General Improvement District and Douglas County Sewer Improvement District for the construction of a joint-venture waste treatment plant and export line.
6. An advance waste treatment demonstration grant to South Tahoe Public Utility District in the amount of \$75,000.
7. Grant to Incline Village General Improvement District in the amount of \$450,000 for treatment plant expansion and \$698,690 toward an export system.



WASTEWATER PROGRAM GOALS:

The basic goals of a wastewater program for the Basin are:

1. The preservation of water quality in Lake Tahoe by the removal of wastewater from the Basin through connections of all waste-producing facilities to an adequate collection, treatment and export system; and
2. encourage and support the development of treatment methods which will produce water suitable for beneficial reuse in the Basin.

RECOMMENDATIONS:

The Committee recommends:

1. Tahoe Regional Planning Agency requirements for the collection and disposal of wastewater should be at least as high as those of any other regulatory jurisdiction in the Basin.
2. All sewage should be exported from the Lake Tahoe Basin by December 31, 1971.
3. Areas not served by Tahoe Regional Planning Agency approved sewage collection and disposal system, and not having an approved sewage collection and disposal system under contract for construction, should not be granted any additional subdivision approvals, building permits or utility service extensions after December 31, 1970.
4. The "Policy Regarding the Disposal of Sewage and Industrial Wastewater Within the Lake Tahoe Basin," which follows. There should be no variances or exceptions to the provisions of this policy, and this policy should be rewritten in ordinance form as an implementing regulation of the Agency's Regional Plan.

The Agency's Steering Committee, after reviewing the policy, believed there should be a variance procedure and such variance should be: "Variances or exceptions from the provisions of Sub-Section F of Section III may be granted by the Lahontan Regional Water Quality Control Board of the State of California or the Division of Environmental Health of the State of Nevada Department of Health, Welfare and Rehabilitation only in those cases where it is found that the area to be granted a variance is not included within an existing or proposed sewage export service area on the Agency's Public Services and Facilities Plan."

POLICY REGARDING THE DISPOSAL OF SEWAGE AND INDUSTRIAL WASTEWATERS WITHIN THE LAKE TAHOE BASIN

Section 1: Purpose and Intent

The primary purpose of this policy is to protect, promote and enhance the public health and welfare and a superior community environment, and to protect the quality of the surface and ground waters of the Lake Tahoe Basin, by establishing minimum standards and requirements relating to the collection and disposal of sewage and industrial wastewaters. It is intended that this policy be administered with the foregoing principal purpose in mind and more specifically to:

- a. Ensure the preservation of the clarity, beauty and other unique and natural characteristics of the waters of the Lake Tahoe Basin.
- b. Protect all beneficial uses of the waters of the Lake Tahoe Basin including aesthetics, boating, water contact sports, fish and other aquatic life, domestic and irrigation water supplies.
- c. Encourage rapid and orderly development of adequate sewage facilities for all developed and developable lands within the Lake Tahoe Basin.
- d. Assure that sewage treatment, export, and disposal facilities will not become overloaded, resulting in inadequate interim treatment and disposal practices.

Section 2: Definitions

- a. Sewage: Any and all liquid waste substances associated with human habitation.
- b. Industrial Waste: any and all liquid waste substances not sewage, from any producing, manufacturing, or processing operation of whatever nature.
- c. Lake Tahoe Basin: the area defined in PL91-148 as the "Lake Tahoe Region."
- d. Person: any individual, corporation, city, county, district, the state, or any department or agency thereof.
- e. District: any private or public agency which collects, treats, or disposes of sewage or industrial wastes.

Section 3: Policy Regarding Sewage and Industrial Waste Disposal Within the Lake Tahoe Basin

- a. No person or district shall dispose of treated or untreated sewage or industrial waste in the Lake Tahoe Basin.

- b. A district shall be immediately notified in writing by the appropriate state water quality control agency if, in its judgment, further connections to the district's sewage facilities would cause the facilities to exceed their capacity. The appropriate state water quality control agency shall solicit the comments of the Tahoe Regional Planning Agency prior to issuance of such written notification.
- c. No further connections to a district's sewage facilities will be permitted by a district after receipt of a letter as specified in Section 3(b), other than those specified in writing by the state or county health officer as necessary to protect the public health.
- d. No new or additional waste-producing development or activities shall be approved unless an approved sewage facility is provided which will treat and export sewage from the Lake Tahoe Basin.
- e. No septic tanks or other private sewage disposal systems shall be permitted to be installed or maintained or operated within the Lake Tahoe Basin after December 31, 1971.

FUTURE SERVICE AREAS

The service area tributary to each plant shall be determined not only by geographical or political boundaries, but also by financial and economic considerations and by the capability of the treatment plant to treat the contributed sewage, and the capability of the export facilities to adequately dispose of the treated effluent. Any presently unsewered area or local district may be served by the treatment plant and export systems that best meet the following:

1. Available or potential capacity to serve the estimated needs of the area.
2. Ability, physical or financial, to be expanded if future capacity proves necessary.
3. Assurance of continued service to the area to be sewered.
4. Most economical treatment and export system.

No new sewer districts should be formed if it is feasible for the area to be served by an existing district.

FUTURE GRANT PROJECTS

There are several categories of projects which may be the subject of a grant application including construction, research and demonstration projects.

Research grants and demonstration grants are not competitive for funds with construction grants. Neither is there likely to be local competition between various research or demonstration grant applicants. Therefore, it is anticipated that all worthy unduplicated research or demonstration grant applications would be approved by the Tahoe Regional Planning Agency. Construction grants are competitive and the two states have each assigned Number One priority within the state to projects at Lake Tahoe. The matter of establishing local priorities would be based on type of project, rather than location. The same type of product application originating in two or more Tahoe sewer districts would ordinarily be assigned the same priority if the water quality control objectives were comparable.

A. Construction Grant Priorities - In general, construction grant priorities would be as follows:

1. Wastewater treatment plants and export system.
2. Interceptor sewers and pump stations to serve existing developments as defined by the Regional Plan.
3. Interceptor sewers and pump stations to open up new areas for development as defined by the Regional Plan.
4. Local sewers: At this time there are no federal construction grants for local collection systems. If funds should become available in the future, the priorities would be as follows, according to type of area to be served:
 - a. Existing structures
 - b. Existing unimproved lots
 - c. Approved subdivisions
 - d. Planned subdivisions

B. Research and Demonstration Grants will be reviewed on the basis of the following:

1. Significance in meeting the objectives of the Agency's wastewater program.
2. National significance.
3. Lack of competition with other similar grants in the Basin.

REGIONAL WASTEWATER TREATMENT PLANTS AND EXPORT SYSTEMS

The following plants are designated by the Agency as regional plants to serve the Tahoe Basin in the treatment and export of sewage:

1. South Tahoe Public Utility District plant
2. Tahoe City Public Utility District and North Tahoe Public Utility District interim plant
3. Incline Village General Improvement District plant
4. Douglas County Sewer Improvement District No. 1 and Round Hill General Improvement District plant

It is anticipated that all sewage generated in the Basin will be treated and exported by one of these four plants, although this may require annexation of new territory to existing districts or completion of service contracts for land areas not presently sewered. Because of the high cost of adequate treatment and export systems and the difficulties in finding final disposal sites, it is extremely doubtful that any additional regional plants are justified. Rather, it may be indicated that existing regional plants be combined. Each proposal for a new treatment plant or export system should be carefully scrutinized and analyzed on an individual basis.

Sufficient land areas should be provided at all wastewater treatment plant sites to permit future construction of advanced treatment processes in recognition of the fact that the Tahoe Basin will be water deficient in the future, and some beneficial reuse of water for irrigation, recreation, etc., may become more feasible when treatment technology is further advanced.

ABBREVIATIONS USED

| | |
|-----------------|---|
| BOD | Biological Oxygen Demand |
| Cl | Chlorides |
| COD | Chemical Oxygen Demand |
| DCSID | Douglas County Sewer Improvement District |
| DO | Dissolved Oxygen |
| gpm | Gallons per minute |
| JTUs | Jackson Turbidity Units |
| MBAS | Methylene Blue Absorbable Substances |
| mg | Million gallons |
| mgd | Million gallons per day |
| mg/l | Milligrams per liter |
| ml | Millileters |
| mo. | Month |
| MPN | Most Probable Number |
| pH | Hydrogen Ion Concentration |
| ppm | Parts per million |
| PO ₄ | Phosphate |
| RHGID | Round Hill General Improvement District |
| SS | Suspended Solids |
| STPUD | South Tahoe Public Utility District |
| TDS | Total Dissolved Solids |

APPENDIX A

DOUGLAS COUNTY SEWER IMPROVEMENT DISTRICT AND ROUND HILL GENERAL IMPROVEMENT DISTRICT DATA

SANITARY SEWER ELEMENTS

A. Plan characteristics

1. Douglas County Sewer Improvement District No. 1 and Round Hill General Improvement District, jointly owned facilities.
2. Statutory authority - Nevada Revised Statutes, Chapter 309 (DCSID No. 1) and 318 (RHGID).
3. Treatment Plant

a. Design Capacity:

| | |
|----------------------------|----------|
| (1) Average flow | 3.0 mgd |
| (2) Peak flow rate | 6.0 mgd |
| (3) Maximum hydraulic rate | 6.0+ mgd |

b. Raw Wastewater Influent Quality:

| | |
|------|--------------|
| MBAS | 3.2-7.0 mg/l |
| BOD | 200-700 mg/l |
| SS | 100-400 mg/l |
| Odor | Odor |

c. Flow:

| | |
|-------------|----------------|
| Annual flow | 1969 - 240 mgd |
| | 1970 - 257 mgd |

| | |
|--------------------|---------|
| Maximum daily flow | 1.0 mgd |
|--------------------|---------|

- d. Expansion potential: Plant capacity can be increased to 9 mgd or more on present site.

e. Present population served:

| | |
|----------------|--|
| Average Winter | 3,000 (Permanent population) |
| Peak Summer | 20,000 (Equivalent permanent population) |

f. Historic maximum daily flow:

August 15, 1970

1.0 mgd

g. Emergency operating procedures:

All major pump stations have complete standby power and pumping equipment. The treatment plant has complete standby for all equipment necessary to operate primary and secondary phases of treatment and pumping effluent to the reservoir. The reservoir is maintained at a level which permits 30 days emergency storage. There is no plant by-pass and all equipment has complete standby capabilities.

4. Export lines and lift stations

a. Design capacity: (1) export pump stations - 6.0 mgd, (2) export pipe lines - 6.0 mgd.

b. Expansion potential: 9.0 mgd.

5. Effluent disposal

a. Standards for discharge into the Carson River Basin are set forth by the State Department of Health as follows:

| <u>Description</u> | <u>Quantity</u> |
|--------------------|---------------------|
| BOD | 15 mg/l |
| SS | 15 mg/l |
| DO | 6 mg/l at discharge |

No floating or objectionable materials.

b. Effluent quality:

Quality Parameter

| | | |
|-------------------------------|------------|---|
| MBAS | 0.5 mg/l | |
| BOD | 6-14 mg/l | |
| SS | 8-14 mg/l | |
| Phosphate | 18-50 mg/l | |
| Nitrate Nitrogen, as N | 5-12 mg/l | |
| Coliform Bacteria, MPN/100 ml | | 0 |

B. Program Characteristics

1. Revenue Sources

a. DCSID No. 1:

(1) Property tax rate 1970-71 - \$0.99/\$100 assessed value
Taxable assessed value - 1970-71 - \$19,937,145
Tax Income 1970-71 - \$197,378

(2) Sewer Service Charges
Single family residences - \$36.00/year
Metered Commercial connections - \$0.87/1000 gallons
Revenue 1970-71 - \$224,437

b. RHGID:

(1) Property tax rate 1970-71 - \$2,337/\$100 assessed value
Taxable assessed value 1970-71 - \$4,142,502
Tax Income 1970-71 - \$96,810
Special Assessment Income - \$580,000

(2) Sewer Service Charges
Single family residences - \$7.00/mo.
Metered Commercial connections - \$0.88/1000 gallons
Revenue 1970-71 - \$13,000

2. Bonded Indebtedness

a. DCSID No. 1 actual, June 30, 1970:

(1) General obligation \$2,920,000
(2) Special assessment \$ 54,000

b. RHGID actual, June 30, 1970:

(1) Special assessment \$3,800,000

3. Capital Improvement plans - none.

4. Additional information

No other services are provided by DCSID No. 1. However, RHGID performs other functions including water supply, road construction and maintenance, drainage facility construction and maintenance and street lighting.

APPENDIX B

ELK POINT SANITATION DISTRICT

SANITARY SEWER ELEMENTS

1. Elk point Sanitation District comprises the area included within the Elks Subdivision in Douglas County, Nevada. All lots will be provided with sewage collection system.
2. Statutory authority - Chapter 318, Nevada Revised Statutes.
3. Population served - 450
4. Financing - Special assessments to 96 parcels.
5. Operation and maintenance by DCSID No. 1 by contract.
6. District authority is to construct sewerage improvements.

MAJOR FACILITIES AND CAPACITIES

- A. Treatment to be in DCSID No. 1 treatment plant.
- B. Lift Stations (to be constructed):
 - (a) 50 gpm Cantex prefabricated
 - (b) 20 gpm Cantex prefabricated
- C. Trunk Sewers (to be constructed): 2072 lineal feet of 8-inch diameter sewer from Lakeview Avenue to Elk Point Road at Nevada Beach. Collection Lines (to be constructed): 2427 lineal feet of 6-inch diameter sewer.
- D. Export Lines: DCSID No. 1 line to Carson River.

APPENDIX C

INCLINE VILLAGE GENERAL IMPROVEMENT DISTRICT DATA

SANITARY SEWER ELEMENTS

1. Incline Village General Improvement District
2. Statutory authority - Chapter 318, Nevada Revised Statutes
3. Population served - 6,500
4. Financing and costs - The entire sewerage works has been financed by special assessments apportioned to each land parcel. As of this date there are 16,859 parcels. Cost of system, \$13,695,157. This does not include local sewers or service lines.
5. Capital improvements: Must be by special assessments. Operation and maintenance from service charge, presently \$4.00/month per 8,000 gallons/25 fixture units, then \$0.40/1000 gallons additional. There is a \$250/25 fixture unit connection charge. There was a loss in the sewer service account of \$2,164.96. Present costs are \$0.93 per 1000 gallons.
6. District has authority to and does provide:
 - Water
 - Sewer
 - Garbage Disposal
 - Recreation Beaches

MAJOR FACILITIES AND CAPACITIES

A. Treatment Plant

This treatment facility is located in the NE¼ Sec. 23, T16N, R18E. This is an activated sludge plant, average flow capacity of 0.5 mgd, a peak of 1.0 mgd. Experience indicates flow cannot exceed 0.7 mgd without reduction in the treatment efficiency. Present flows reach 0.6 mgd.

A new 3.0 mgd activated sludge plant is under construction; scheduled for use in August 1971. Peak flows would be 4.8 mgd.

There are two storage ponds on the site for effluent storage or by-pass. Volume 25 mg.

This plant has no digester; sludge will be dewatered and removed from Tahoe Basin with solid wastes. As capacity approaches 2-3 mgd, sludge volume may require incineration. At this time primary clarifiers will become necessary; these, together with the incinerator, will cost about \$1,000,000, but with these additions average treatment capacity will increase to 4.5-5.0 mgd.

B. Lift Stations

The main lift station (No. 1) is across Lakeshore Boulevard from Incline Beach - presently, this station collects all sewage and pumps to the treatment plant against a head of 400 feet. This station has auxiliary standby power.

Station No. 2 serves the condominium area along the Crystal Bay shoreline.

Station No. 3 serves the Chataux.

Station No. 4 serves the pool and concession at Burnt Cedar Beach.

Station No. 5 serves the homes just west of Incline Beach.

There is a small station (No. 6) at Lakeshore Drive serving the Mill Creek, Ponderosa and Industrial areas.

Pump stations and trunks which will change the collection system are now under construction.

Station No. 7 at Lakeshore Boulevard will lift Ponderosa subdivision sewage just west of Burnt Cedar Beach into the Lakeshore Boulevard line, correcting an adverse grade condition at that point. This will be ready by midsummer; the Lakeshore Boulevard line, however, can operate in the interim.

Station No. 9 is a small station on Lakeshore Boulevard, receiving sewage from a small number of houses east of Burnt Cedar. This is in operation, but not completed.

Station No. 1 continues to be the main station pumping into the treatment plant. This has been modified with new pumps to discharge at 1400 gpm directly to the treatment plant. After midsummer 1971, this station will serve only the area below Tahoe Boulevard.

Station No. 8, a new pump station at Tahoe Boulevard and Country Club Drive, will now serve a new collection main, intercepting all sewage above Tahoe Boulevard, and pump this directly into the treatment plant, relieving pump station No. 1. This station has auxiliary power.

C. Trunk Sewers

The main trunk sewer is a 10 to 12 inch diameter line along the north side of Lakeshore Boulevard to Pump Station No. 1. In addition to the main trunk and a line along Tahoe Boulevard, there is a new gravity collector from the newer Incline, Inc., Subdivisions 1, 1a, 1b, 2, 3, 5 and 6, and all those areas above this line at Campbell Road, Village Boulevard, and north and east of Country Club Drive. This gravity line crosses Pond No. 2 to the treatment plant.

Collection Sewers

At this time a service line is stubbed to the property line of every lot in Incline Village and ready for service. All new homes will be connected; all septic tank systems requiring service of

any kind will connect. There are probably 450 homes on septic tanks. An order to connect now is premature, until the new plant is ready in August. Any application for connection is approved.

D. Export Lines

There is an export line from the treatment plant on Sweetwater Road, along U. S. Highway 28 to Spooner Lake area, across Spooner Meadow to U. S. Highway 50 and to the Carson River in Sec. 17, T14N, R20E.

This export line is a welded steel pressure line with a total length of 19.28 miles (59,983 feet of 16-inch, 5124 feet of 14-inch, 17,000 feet of 12-inch, 17,400 feet of 10-inch and 2300 feet of 8-inch).

There is a pump station for this export line just east of the Nevada State Park at Sand Harbor. Initial capacity is 3.0 mgd; this can be increased to 5 or 6 mgd by adding another pump. There is standby power.

E. Disposal sites

From the treatment plant, treated effluent is piped to the 74 acre golf course where it is applied by overhead sprinklers during the growth season.

During winter months effluent had previously been applied to a spray field north of the treatment plant site. Now this method would be used only in emergencies.

The discharge of effluent is into the Carson River during winter months. For 8 months, effluent is applied to land for irrigation in Sections 3, 4, 10 and part of Section 1, T14N, R19E. These farm lands are owned by Harry Schneider whose land is crossed by the export line. This effluent must be confined on Schneider's lands without causing nuisance or contaminating any water supply.

There is an outlet for the Bureau of Land Management in Sec. 11 and Sec. 12, T14N, R19E, for stock and wildlife watering.

| Water Quality | - | Carson River (New Empire Station) |
|-----------------|-----------------------|-----------------------------------|
| PO ₄ | - annual average | 1.0 mg/l |
| | - single value | 2.0 mg/l |
| NO ₃ | - | 2.0 mg/l |
| pH | - annual media | 7.5 to 8.0 |
| | - single value | 6.5 to 8.5 |
| DO | - average (June-Sept) | not less than 7.0 mg/l |
| | - single value | not less than 5.5 mg/l |
| BOD | - | not more than 15.0 mg/l |

| | | |
|-----|------------------|-------------------------|
| CL | - | not more than 30.0 mg/l |
| TDS | - annual average | not more than 450 ppm |
| | - single value | not more than 600 ppm |

Free from materials, other than natural origin, which produce taste or odor in the water or the flesh of fish.

No turbidity or color, from other than natural origin, which will adversely affect the natural appearance of the water.

Free of visible floating oil, floating solids and debris other than natural origin.

Substantially free from sludge banks and debris other than natural origin.

Water Quality Requirements

| | |
|------------|---------|
| Export BOD | 10 mg/l |
| SS | 19 mg/l |
| DO | 6 mg/l |

Chlorine residual 1 ppm at point of discharge

To Schneider's Land and BLM

Landowners must confine water on their land, and Schneider must use entire flow from April 1 - Nov. 1, without nuisance or contaminating underground water.

| | | |
|----------|-----|----------|
| Effluent | BOD | 20 mg/l |
| | SS | 20 mg/l |
| | DO | 6.0 mg/l |

To Carson River

Effluent must be of such quality that the Carson River water quality standards will be met.

Quality of Effluent Exported Jan. 26, 1971

| | |
|-----|-----------|
| CL | 0.75 mg/l |
| DO | 6.1 mg/l |
| SS | .015 mg/l |
| BOD | 10.0 mg/l |
| TDS | 230 ppm |

DISTRICT BOUNDARIES

- A. There are 3 shoreline areas adjacent to and southwest of the present District; these should become part of this District and be served by the District system.

- B. There is an undeveloped area just outside the District east boundary that should be considered for sewer service.
- C. There have been inquiries from the present development at Incline Lake. Subject to this being an ordinary development of housing, contributing domestic sewage, they could be served.
- D. That area between Incline Village General Improvement District west boundary and the California state line, those areas about the north state line and outside Washoe District No. 1, cannot readily or economically be served by this District. The nearest line to this area is that line below State Route 28 and Crystal Bay serving the condominium units. This line flows to a Pump Station No. 2, has a history of clogging, is not on grade, in at least one place is restricted, and repair is extremely difficult. This line is at capacity.

A line to serve this area would possibly have to be along State Route 28 and come all the way to Station No. 8, or even as far as the treatment plant - an expensive installation.

It is suggested that a feasibility study be made of this area west of IVGID and the Nevada state line to determine the most practical service available to this area and then to assign this service area to the District indicated. This should be done at once, and initiated by the Tahoe Regional Planning Agency.

- E. This District serves Sand Harbor State Park, and has indicated willingness to receive the treated effluent from the State Highway Buildings at Spooner Junction.
- F. This District cannot serve a large contributor not in the District, and would be reluctant to serve additional areas other than those described above, especially any service to new large gambling casino hotels not in the District.

In proposing any service to these areas, it is understood that when capacities approach 2.0 mgd in the present plant, added plant must be provided to obtain treatment capacity necessary to meet present discharge requirements.

- G. An obstacle to serving these outside areas presently is enabling legislation. AB No. 264 would make it possible for this District to recover capacity acquisition costs from the areas to be served.

APPENDIX D

KINGSBURY GENERAL IMPROVEMENT DISTRICT DATA

SANITARY SEWER ELEMENTS

A. Plan Characteristics

1. Kingsbury General Improvement District
2. Statutory Authority - Chapter 318, Nevada Revised Statutes.
3. Treatment Plant - None

Sewage treatment and export capacity will be provided by South Tahoe Public Utility District according to contract terms agreed to by both Districts. The contract has been written and accepted by each District, and Kingsbury GID has an option until August 1, 1971 to execute the contract. Initial terms provide for up to 1.0 mgd capacity in the STPUD treatment and export system for joint use by the Kingsbury GID and Tahoe-Douglas District. Additional capacity can be provided in the future, subject to determination by STPUD and possible expansion of the treatment and disposal facilities.

B. Program Characteristics

1. Revenue Sources

- a. Property Tax Rate = \$0.87/\$100 - May be adjusted when sewer service is provided.

Taxable Assessed Value 1969-70 = \$6,005,374

Tax Income 1970-71, estimated = \$52,243

- b. Sewer Service Charge - to be established.

2. Bonded Indebtedness

a. Maximum Allowable

- (1) General Obligation Bonds - Limit determined by statutory limit on total tax rate.
- (2) Revenue Bonds - No statutory limit.
- (3) Special Assessment - Cannot exceed 50% of the true market value of the land after the improvement is made.

b. Actual Bonded Indebtedness

(1) General Obligation - None

(2) Revenue - None

(3) Special Assessment - None outstanding for sewer. Proposed \$3,576,000, to be issued during 1971-72, to finance construction of interceptor sewers and sewage collection systems.

3. Capital Improvement Plans

a. Collection and Interceptor Sewer System

A project is under way to provide an interceptor sewer system to serve the entire Kingsbury District. As a part of the project, presently subdivided or built upon areas will be provided with sewage collection systems. The project is scheduled for a public hearing on May 19, 1971. If the hearing is successful, the project will proceed to construction with completion scheduled for December 1972.

b. Project Data

(1) Initial Design Population - 2,000 peak

(2) Ultimate Design Population - 18,000 peak

(3) Area Served - 5,000 acres (approximately)

(4) Total Sewer Length - 168,000 feet

(5) Estimated Cost

| | |
|------------------------|------------------|
| (a) Interceptor Sewers | \$ 833,000 |
| (b) Collection Systems | <u>2,930,000</u> |
| TOTAL | \$ 3,763,000 |

(6) Proposed Financing

| | |
|-------------------------------|----------------|
| (a) Assessment Bonds | \$ 3,576,000 |
| (b) Federal Grant (PL 84-660) | <u>186,000</u> |
| TOTAL | \$ 3,762,000 |

c. Capital Improvement Plan - No further major capital expenditures will be required. Additional collection systems will be added, through private financing or assessment proceedings, as additional land is developed.

APPENDIX E

NORTH TAHOE PUBLIC UTILITY DISTRICT DATA

SANITARY SEWER ELEMENTS

A. Plan Characteristics

1. North Tahoe Public Utility District
2. Statutory authority - State of California, Public Utilities Act of 1921
3. Treatment Plant - interim joint treatment North Tahoe and Tahoe City Public Utility Districts
 - a. Design capacity 2.5 mgd
 - (1) Average flow 1.0 mgd
 - (2) Peak flow rate 1.4 mgd
 - (3) Maximum hydraulic rate 4.2 mgd
 - b. Annual flow - No record, plant in operation June 1970 Maximum daily flow - 1.4 mgd, January 2, 1971
 - c. Expansion potential - maximum set for 2.8 mgd by U. S. Forest Service
 - d. Present population served, about 15,000. Population to be served with ultimate development of present service area, estimated 100,000.
 - e. Historic maximum daily flow 1.4 mg January 2, 1971.
 - f. Emergency operating procedures
 - (1) Emergency power generation at plant permits operation of primary and secondary during power outages. 1.0 mg emergency storage available at plant.
 - (2) There is no plant bypass.
4. Export lines and lift stations
 - a. North Tahoe design for ultimate Dollar Lift station 9.0 mgd, export pipe line 11.0 mgd.

- b. Expansion potential: (1) no expansion except third pump at Dollar Lift station, (2) all of export pipe and station designed for ultimate within North Tahoe PUD, (3) export line is under design for line from Tahoe City to Truckee, with facilities and disposal site locations still to be determined.

5. Effluent disposal

- a. Present disposal site - Cinder Cone; future site to be determined.

B. Program Characteristics

1. Revenue Sources

- a. Property tax rate, \$1.65/\$100 assessed value Taxable assessed value 1970-71, \$21,000,000 Tax Income 1970-71, estimated \$346,000

- b. Sewer service charges

None

2. Bonded Indebtedness

- a. Maximum allowable

- (1) General Obligation bonds 20% of assessed value
- (2) Revenue bonds, no statutory limit
- (3) Special Assessments, no statutory limit

- b. Actual, June 30, 1970

- (1) General Obligation, \$900,000
- (2) Revenue, none
- (3) Loan, State of California, \$2,385,000
- (4) Special Assessment districts, \$7,100,000

3. Capital Improvement Plans

- a. Collection Sewers:

- (1) Brockway Government Tract
- (2) Beaver Street
Construction to start 1971

- b. Export line down Truckee River with treatment plant and disposal site.
Construction to start 1972-1975.

4. Additional Information

a. Other services provided by District:

- (1) Some street lighting
- (2) Summer and winter recreation program

b. District has authority to provide the following services:

- (1) Water
- (2) Heat
- (3) Power
- (4) Transportation
- (5) Telephone
- (6) Garbage
- (7) Sewage disposal
- (8) Refuse disposal
- (9) Fire department
- (10) Street Lighting
- (11) Parks
- (12) Playgrounds
- (13) Golf courses
- (14) Swimming pools
- (15) Recreation buildings
- (16) Public buildings
- (17) Drainage of roads, streets, and public places
- (18) Curbs, gutters, and street pavement

APPENDIX F

SOUTH TAHOE PUBLIC UTILITY DISTRICT DATA

SANITARY SEWER ELEMENTS

A. Plan characteristics

1. South Tahoe Public Utility District
2. Statutory authority - State of California Public Utilities Act of 1921
3. Treatment plant

a. Design capacity:

| | |
|-------------------------------|----------|
| (1) Average flow | 7.5 mgd |
| (2) Peak flow rate | 15.0 mgd |
| (3) Maximum hydraulic rate | 20.0 mgd |
| (4) Influent characteristics: | |

| Quality Parameter | Raw Wastewater Influent |
|------------------------------|-------------------------|
| MBAS | 4-9 mg/l |
| COD | 200-500 mg/l |
| BOD | 250-300 mg/l |
| Turbidity | 100 JTU's |
| SS | 225 mg/l |
| Phosphorus | 10-15 mg/l |
| Ammonia Nitrogen | 20-30 mg/l |
| Coliform Bacteria MPN/100 ml | 15,000,000 |
| Color | High |
| Odor | Odor |

b. Annual flow

1969-791.6 mg
1970-877.5 mg

Maximum daily flow
3.44 mg, December 31, 1970

- c. Expansion potential - plant capacity can be increased to 15.0 mgd or more on present site.
- d. Present population served, about 36,000.
Population to be served with ultimate development of present service area, estimated 225,000.

e. Historic maximum daily flow 3.44 mg, Dec. 31, 1970.

f. Emergency operating procedures:

(1) Emergency power generation at plant permits operation of primary and secondary during power outages, water is stored in secondary effluent ponds for tertiary treatment upon restoration of normal electric power, 2.0 mg emergency storage available at plant, plus 6.0 mg nearby.

(2) There is no plant bypass; duplicate treatment units and alternate modes of plant operation have allowed 3 years of uninterrupted plant operation in meeting export water quality standards

4. Export lines and lift stations

a. Design capacity, (1) export pump stations, 7.5 mgd, (2) export pipe lines 7.5 mgd.

b. Expansion potential, (1) export pump station, 15.0 mgd in present building, (2) export pipeline capacity can be increased to 15.0 mgd by replacement of pumps at plant with higher head units and paralleling one short section of the Luther Pass line with a second line.

5. Effluent disposal

a. Standards for Indian Creek Reservoir as set by Alpine County and the Lahontan Regional ater Quality Control Board.

Requirements

Lahontan R. W. Q. C. B.

Percent of Time

| Description | Alpine | Percent of Time | | |
|-----------------------|---------------------------|---|-----|-----|
| MBAS, mg/l, less than | 0.5 | 0.3 | 0.5 | 1.0 |
| BOD, mg/l, less than | 5 | 3 | 5 | 10 |
| COD, mg/l, less than | 30 | 20 | 25 | 50 |
| mg/l, less than | 2 | 1 | 2 | 4 |
| Turbidity, JTUs | 5 | 3 | 5 | 10 |
| Phosphorus, mg/l | | No Requirements | | |
| pH | 6.5 to 8.5 | 6.5 to 9.0 | | |
| Coliform MPN/100 ml | Adequately Disinfected | Median less than 2. No more than two consecutive samples greater than 23. | | |

b. Effluent Quality

Quality Parameter

| | |
|------------------------------|---------------|
| MBAS | 0.1 mg/l |
| COD | 10 mg/l |
| BOD | 1 mg/l |
| Turbidity | 0.2 JTUs |
| SS | 0.0 mg/l |
| Phosphorus, as P | 0.06 mg/l |
| Ammonia Nitrogen | 3.0* mg/l |
| Nitrate Nitrogen, as N | 0.9 mg/l |
| Nitrate Nitrogen, as N | 0.01 mg/l |
| Coliform Bacteria MPN/100 ml | Less than 2.2 |
| Color | Colorless |
| Odor | Odorless |

*Including reduction upon entry to Indian Creek Reservoir.

c. No direct discharge to stream

B. Program Characteristics

1. Revenue Sources

- a. Property tax rate - \$1.15/\$100 assessed value
Taxable assessed value 1970-71 - \$83,000,000
Tax Income 1970-71 - estimated \$957,000
- b. Sewer service charges
Average residence - \$29.60 per year
Revenue 1970-71 - estimated \$410,000

2. Bonded Indebtedness

- a. Maximum allowable:
 - (1) General Obligation bonds - 20% of assessed value
 - (2) Revenue bonds - no statutory limit
 - (3) Special Assessments - no statutory limit
- b. Actual, June 30, 1970:
 - (1) General Obligation - \$2,463,000
 - (2) Revenue - \$1,815,000
 - (3) Loan, State of California - \$1,190,148
 - (4) Special Assessment Districts - \$12,749,839

3. Capital Improvement Plans

a. Collection Sewers:

- (1) Extension from Baldwin Beach to Emerald Bay
- (2) Extension to Fallen Leaf Lake and Angora Highlands

b. Proposed construction date 1971-72

c. Construction funded by special assessments

4. Additional Information

a. Other services provided by District - some street lighting

b. District has authority to provide the following services:

- (1) Water
- (2) Heat
- (3) Power
- (4) Transportation
- (5) Telephone
- (6) Garbage disposal
- (7) Sewage disposal
- (8) Refuse disposal
- (9) Fire department
- (10) Street lighting
- (11) Parks
- (12) Playgrounds
- (13) Golf courses
- (14) Swimming pools
- (15) Recreation buildings
- (16) Public buildings
- (17) Drainage of roads, streets, and public places
- (18) Curbs, gutters, and street pavement

APPENDIX G

TAHOE CITY PUBLIC UTILITY DISTRICT DATA

SANITARY SEWER ELEMENTS

A. Plan Characteristics

1. Tahoe City Public Utility District
2. Statutory Authority - State of California Public Utilities Act of 1921
3. Treatment Plant - interim joint treatment North Tahoe and Tahoe City Public Utility Districts
 - a. Design Capacity 2.5 mgd
 - (1) Average flow 1.0 mgd
 - (2) Peak flow rate 1.4 mgd
 - (3) Maximum hydraulic rate 4.2 mgd
 - b. Annual flow - No record, plant in operation June 1970 Maximum daily flow - 1.4 mgd, January 2, 1971
 - c. Expansion potential - maximum set for 2.8 mgd by U. S. Forest Service
 - d. Population to be served with ultimate development of present service area, estimated 87,000
 - e. Historic maximum daily flow, 1.4 mg, January 2, 1971
 - f. Emergency operating procedures:
 - (1) Emergency power generation at plant permits operation of primary and secondary during power outages. 1.0 mg emergency storage available at plant.
 - (2) There is no plant bypass.

APPENDIX H

TAHOE-DOUGLAS DISTRICT DATA

SANITARY SEWER ELEMENTS

A. Plan Characteristics

1. Tahoe-Douglas District
2. Statutory Authority - Chapter 318, Nevada Revised Statutes.
3. Treatment Plant - None

Sewage treatment and export capacity will be provided by South Tahoe Public Utility District according to contract terms agreed to be both Districts. The contract has been written and accepted by each District, and Tahoe-Douglas has an option until August 1, 1971, to execute the contract. Initial terms provide for up to 1.0 mgd capacity in the STPUD treatment and export system for joint use by the Tahoe-Douglas and Kingsbury General Improvement Districts. Additional capacity can be provided in the future, subject to determination by STPUD and possible expansion of the treatment and disposal facilities.

B. Program Characteristics

1. Revenue Sources

- a. Property Tax Rate - Will be established when sewer service is provided. Present tax rate is \$0.30/\$100 assessed value.
- b. Sewer Service Charge - To be established when sewer service is provided.

2. Bonded Indebtedness

a. Maximum Allowable

- (1) General Obligation bonds - Limit determined by statutory limit on total tax rate
- (2) Revenue bonds - No statutory limit
- (3) Special Assessments - Cannot exceed 50% of the true market value of the land after the improvement is made.

b. Actual Bonded Indebtedness

- (1) General Obligation - None
- (2) Revenue - None

- (3) Special Assessment - Proposed \$5,900,000 in bonds to be issued during 1971-72 to finance construction of interceptor sewers, pump stations, and sewage collection systems.

3. Capital Improvement Plan

a. Collection and Interceptor Sewer System

A project is underway to provide an interceptor sewer system to serve the entire Tahoe-Douglas District. As a part of this project, the presently subdivided or built upon areas will be provided with sewage collection systems. The project is scheduled for a public hearing, concerning the assessment financing, on May 19, 1971. If the hearing is successful, the project will proceed with completion scheduled for December 1972.

b. Project Data

- (1) Initial Design Population - 5,000 peak
- (2) Ultimate Design Population - 21,000 peak
- (3) Area Served - 3,400 acres (approximately)
- (4) Total Sewer Length - 216,000 feet
- (5) Estimated Cost

| | |
|---|------------------|
| (a) Interceptor Sewer and Pump Stations | \$ 3,463,600 |
| (b) Collection Systems | <u>3,344,000</u> |

| | |
|-------|--------------|
| TOTAL | \$ 6,807,600 |
|-------|--------------|

(6) Proposed Financing

| | |
|-------------------------------|------------------|
| (a) Assessment bonds | \$ 5,791,600 |
| (b) Federal Grant (PL 84-660) | <u>1,016,000</u> |

| | |
|-------|--------------|
| TOTAL | \$ 6,807,600 |
|-------|--------------|

- c. Capital Improvement Plans - No further major expenditures will be required. Additional collection systems will be added, through private financing or assessment proceedings, as additional land is developed.

APPENDIX I

WASHOE COUNTY SEWER IMPROVEMENT DISTRICT NO. 1 DATA

SANITARY SEWER ELEMENTS

A. Plan Characteristics

1. Washoe County SID No. 1
2. The Washoe County Sewer Improvement District No. 1 was formed and exists by virtue of Chapter 307, Nevada Revised Statutes.
3. The District facilities consist only of collection and metering work. Treatment and disposal is accomplished by contract with the North Tahoe Public Utility District and the Tahoe City Public Utility District. All District flows are being exported outside the basin at this time, with disposal into the Cinder Cone. All District facilities are gravity flow.

B. Program Characteristics

1. The operation, maintenance and debt retirement is assessed annually and collected by the County. There is no ad valorem tax for sewer service at this time.
2. The District is indebted in the amount of \$560,000 for the 1969 Bond, Series 1, Issue No. 1. The District will be bonded to the practicable limit with the forthcoming \$150,000 General Obligation bond.
3. The District proposes to construct a proportion flow device and a low level bypass line this fall. With the construction of the bypass, the District's sewerage facilities will be complete and no additional facilities will be required until after 1995 (according to projections).
4. The District also provides water service.

Property of
the U.S. Forest Service